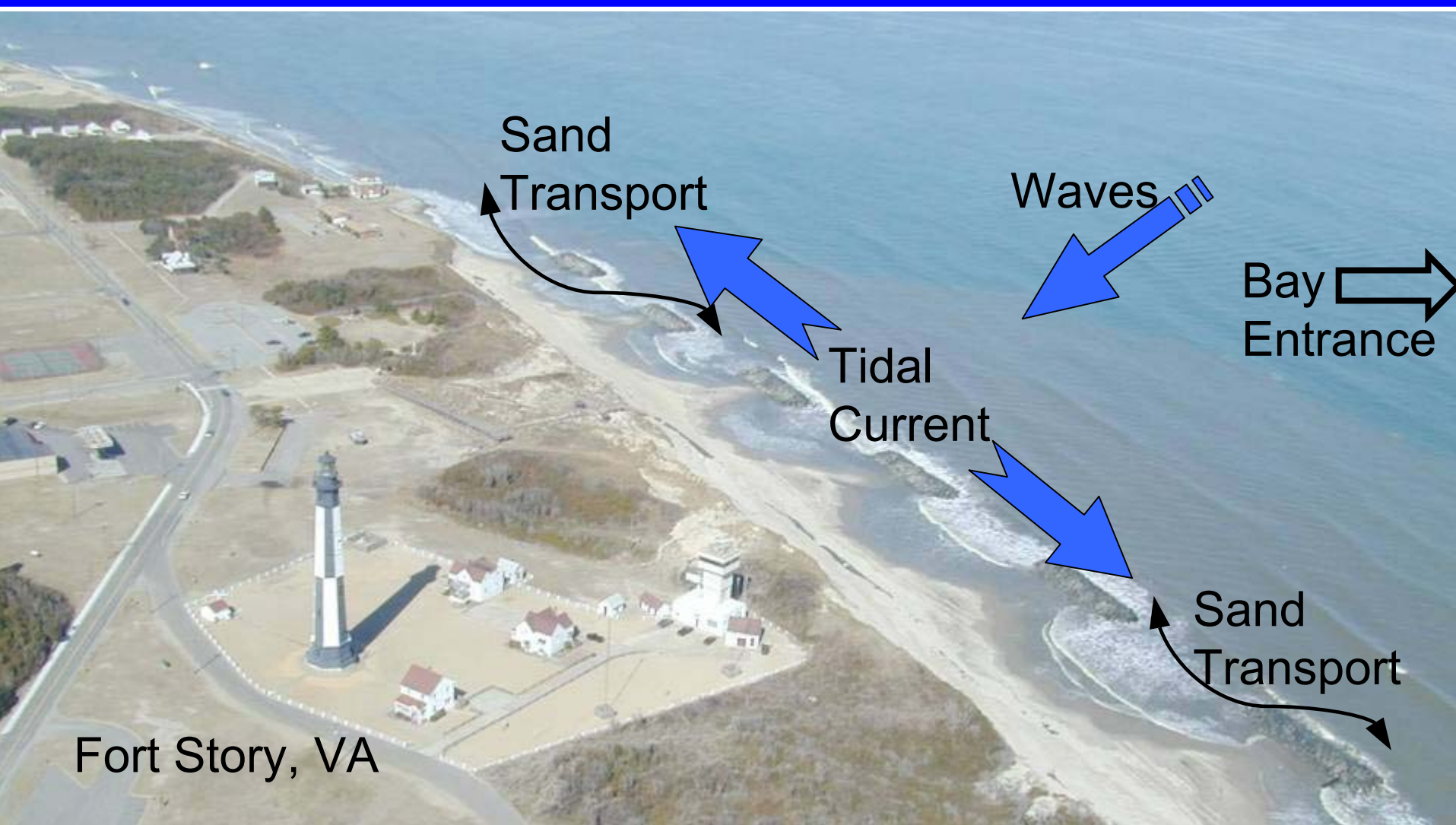
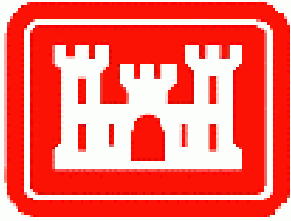


GENESIS-T

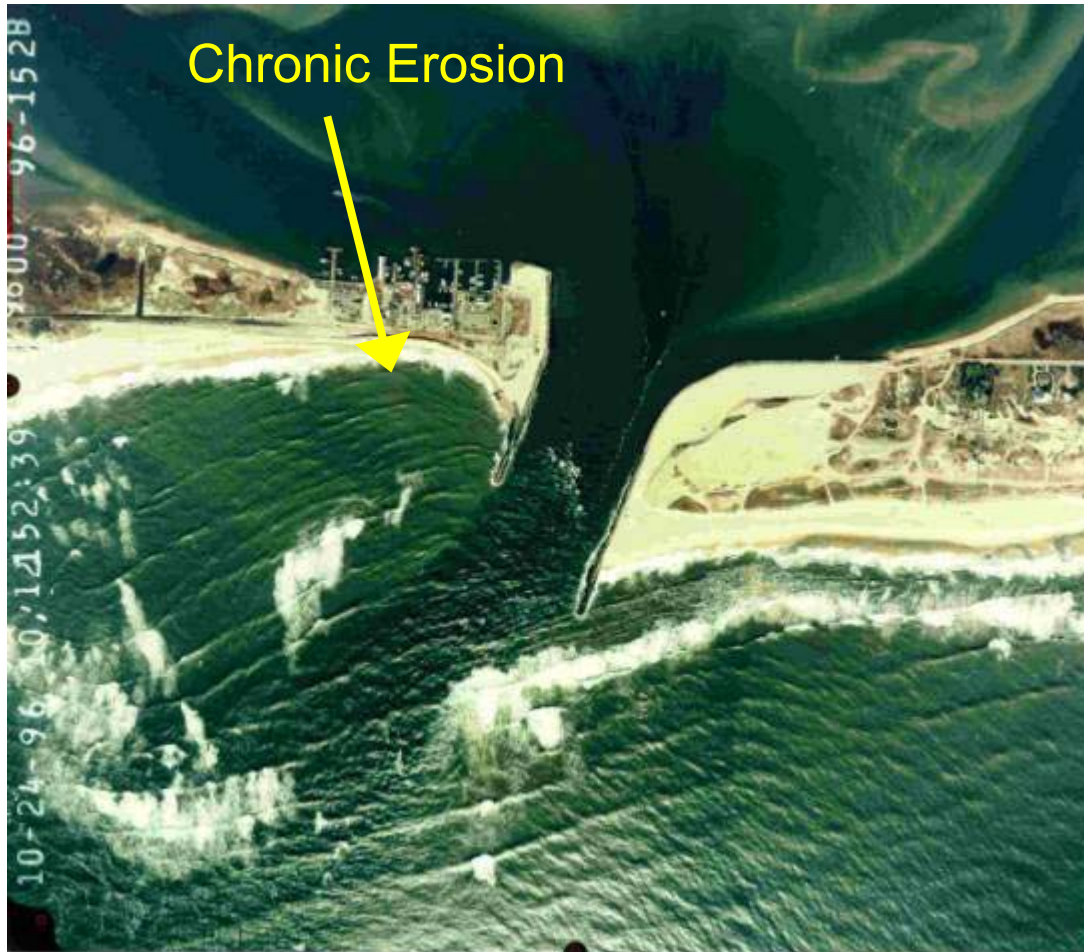
Numerical Model & Physical Model Experiments





GENESIS-T

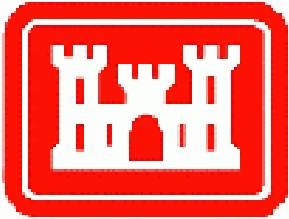
Addressing Design Need at Chronically Eroding Beaches Downdrift of Inlets



Shinnecock Inlet, NY

Example of chronic downdrift erosion that can lead to breaching and loss of property.

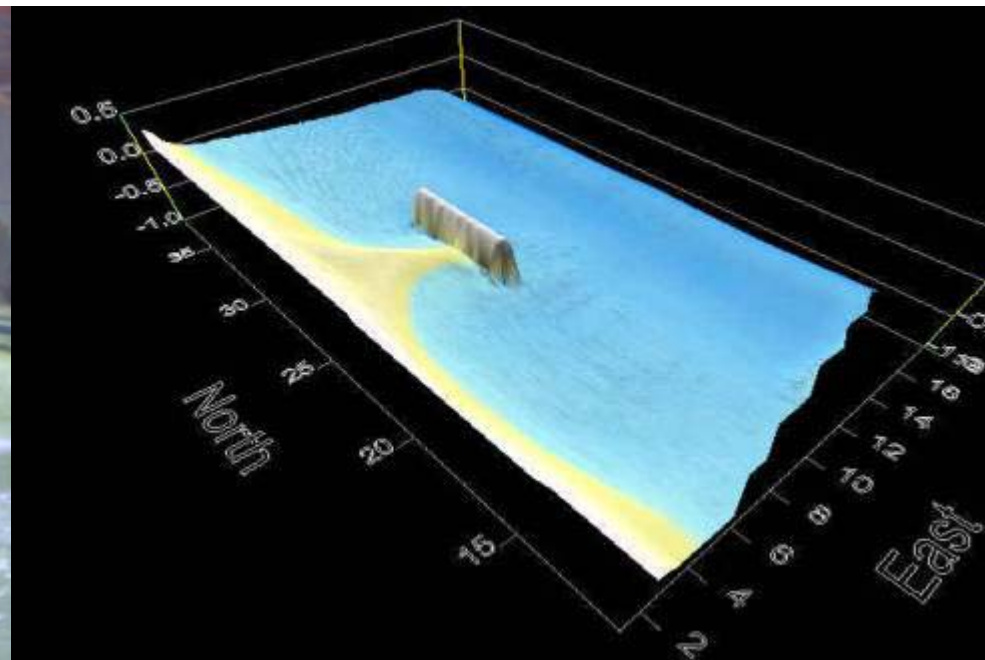
Structures such as T-head groins and detached breakwaters are a possible solution.

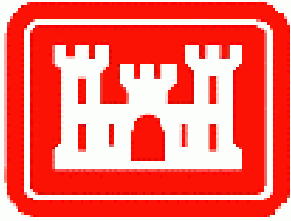


Problem Statement



- Predictive capability for sand transport and shoreline evolution in presence of waves and currents (tidal current, wind-generated current).
- Design capability for shoreline stabilization through headland structures (headland breakwater, T-groins, jetty spurs) near inlets.

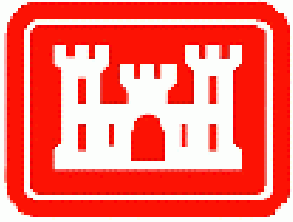




GENESIS-T Approach



- Physical model tests of headland structures in Longshore Sediment Transport Facility (LSTF). Measured 3D morphology development, waves, currents, sediment concentrations, and total sediment transport load in vicinity of headland structure in the presence of breaking waves and external currents.
- Theoretical development of sand transport relationship for waves and currents. Shoreline evolution algorithms for tombolo formation in GENESIS.
- Implementation of enhancements in GENESIS/T
 - Transport $f(\text{waves, currents})$
 - Stable morphologic features
 - Tombolo development



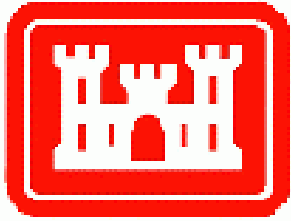
GENESIS-T

Physical Model Tests



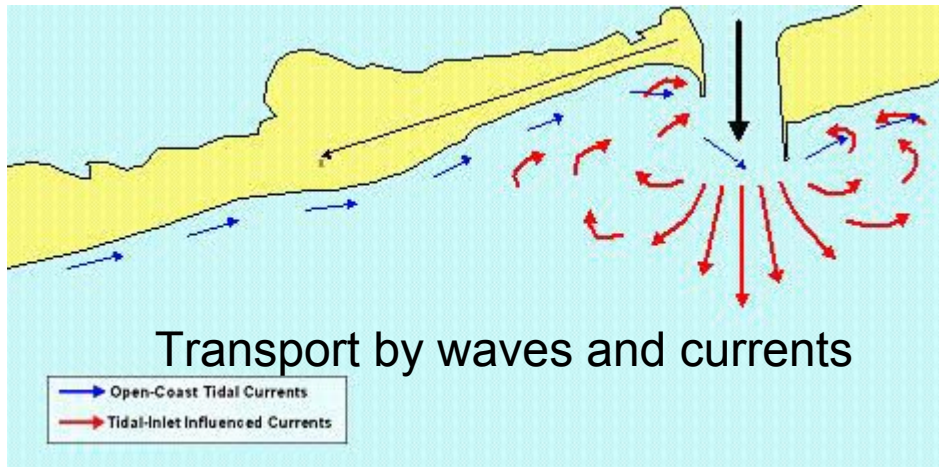
- FY04: Waves and external current tests (4 cases)
Headland breakwaters, tombolo development (2 cases)
- FY05: T-groin tests, Headland breakwaters (short & close to shore)



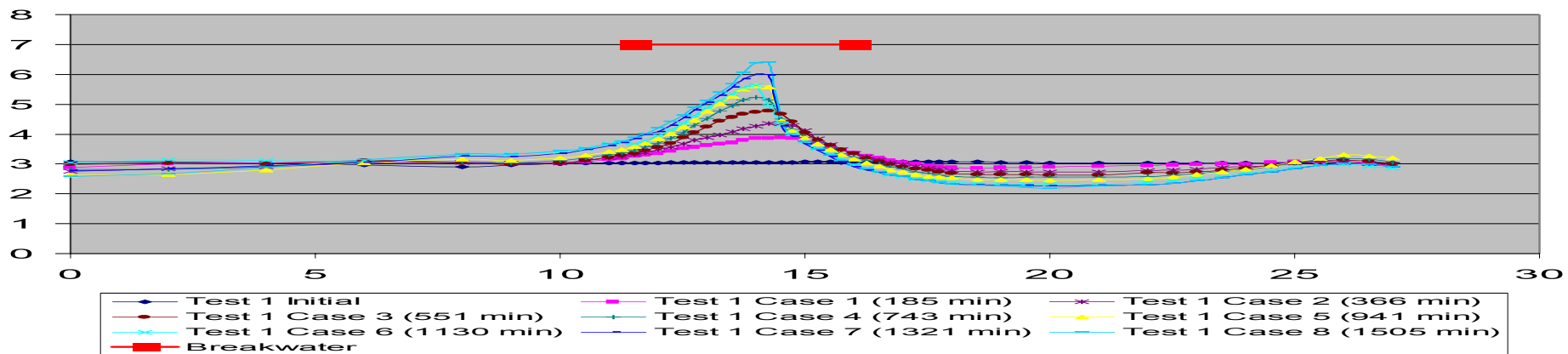


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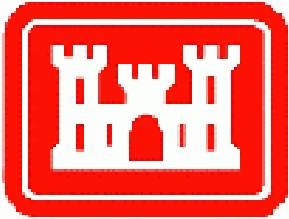
Theoretical developments, GENESIS/T upgrades



Stable morphologic features



Tombolo development



GENESIS-T Tech Transfer



**Fort Clinch, FL, next to navigation
channel, St. Marys Entrance**

- GENESIS-T in NEMOS interface
 - Released August 2004
 - Beta-test applications
 - Ft. Story, VA
 - Bal Harbor, FL
 - Coney Island/Sea Gate, NY
- CHETNs
- Journal articles
- Technical report
- Data sets on fundamental sediment transport